

APPENDIX A

STUMPCAM OPERATING INSTRUCTIONS

DESCRIPTION:

The **StumpCam™** system is a self-contained, battery operated, programmable video recording system comprised of two weatherproof enclosures. The enclosures house a camcorder and all the circuitry need to allow automatic, unattended video operation. The system can be operated by either a 120VAC mains-powered charger or with a solar panel to charge the internal 12 volt 5 amp-hour battery. The system has been designed to automatically switch between operation in daylight using available light and nighttime using an on-board infrared illuminator and filter.

The camera side of the system houses the camcorder, day/night filter, drive motor and limit switch, infrared light assembly, and the camera interface printed circuit board (PCB).

The control side houses the programming display, 12 volt battery and charger regulator, passive infrared motion detector, day/night sensor, setup LED, micro-controller PCB, and a control panel with a 12-key keypad used to program the system.

OPERATION:

To begin operation of your **StumpCam™** system, place the **StumpCam™** in the desired location to video. Open the camera side housing and place the camcorder **RECORD-OFF-PLAYBACK** switch to **PLAYBACK**. Open the viewing panel on the side of the camera to preview the area the camera will be recording. Zoom the camera in or out to the desired viewing effect. Place the camcorder on manual focus mode and manually focus on the area you desire to video. If it unknown where the subjects to be videoed may enter the camera field of view, the camcorder can be operated in the autofocus mode. However, the camcorder may not always automatically focus on the desired objects.

Once the camera field of view is set, close the viewing panel, place the camcorder's **RECORD-OFF-PLAYBACK** switch to **RECORD** and the **NIGHTSHOT** switch to the **NIGHTSHOT** position. Securely close the camera side box.

To program the system, begin by opening the control side box to reveal the three controls labeled **POWER/OFF**, **CONTRAST**, and **RESET**.

The **POWER/OFF** switch indicates the system is powered up when the toggle switch is pointing to the **POWER** label, and is powered down when the switch is pointing to the **OFF** label.

The **CONTRAST** control is used to make the display viewable under different lighting conditions and viewing angles. To use it, toggle the **POWER/OFF** switch to the **POWER** position. The

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CONTRAST knob then can be rotated left or right until the display is viewable to your satisfaction.

The **RESET** button is used to return the system to its initial power-on state should you desire to change the program set at a previous time or if a mistake is made during programming.

StumpCam™ can be programmed to operate under two basic **Operating Modes**:

1. The amount of time (in seconds) that must elapse before the unit will record.
2. The number of events the motion detector must sense before the unit will record.

Operating Mode 1. To begin programming, push the **POWER/OFF** switch to the **POWER** position. The system will wake up, automatically determine whether it's light or dark out, and park the filter (located immediately in front of the camera lens) to the appropriate position while displaying the message **PARKING FILTER, PLEASE WAIT**. It will be necessary to wait until the filter stops moving before proceeding.

Once the filter is parked, the message **PRESS N TO SCROLL MENU** appears. As **N** is depressed and released, the menu items that scroll by are:

RECORD?
SETUP?
REWIND?
PLAY?
SEARCH?

If **Y** is pressed when any of these items are displayed, that choice will be entered and additional messages will come up asking for more entries or providing more information.

If **Y** is pressed while the **RECORD?** message is displayed, the display will change to read **SET ON TIME?**. This choice allows you to set the amount of time the camera records once activated. If **Y** is pressed when the display reads **SET ON TIME?**, the message will change to **ENTER ON TIME:**. At that point, the desired recording time (in seconds) per event is entered using the keypad. Recording times can vary from 10 to 999 seconds. As the keys are pressed, the display will indicate the recording time you selected by displaying the numbers on the second line of the display. If a mistake is made in entering the time, the **N** key can be pressed at any time. This will take the display to the top of the menu, and the menu can then be scrolled to the proper choice and the data re-entered. Once the desired time has been entered, the **Y** key is pressed.

The display will then change to read **SET OFF TIME?**. This function allows you to set the amount of time between recordings. If **Y** is pressed when the display reads **SET OFF TIME?**, the message will change to **ENTER OFF TIME:**. The desired off time (in seconds) is then entered and can vary from 10 to 999 seconds. After the desired off time is entered and the **Y** key is pressed, the display will go blank and the camera will begin a test recording within a few seconds. After closing the control box, the programming is complete for Operating Mode 1 and the unit is ready for operation.

Operating Mode 2. If **N** is pressed when the **SET OFF TIME?** message is displayed, the display will scroll to **SET SKIP HITS?**. This function allows the camera to remain inactive until a certain number of events transpire and then record for the amount of time selected under **ENTER ON TIME:**. If **Y** is pressed when **SET SKIP HITS?** is displayed, the display will change to **ENTER**

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SKIP HITS: The number of events (from 1 to 999) to skip between recordings is chosen using the keypad and entered by pressing the Y key. When Y is pressed after entering the number of hits to skip, the display will go blank and the camera will make a single test recording within a few seconds. After that, recordings will only be made when the number of events sensed by the motion detector exceeds the number of hits chosen. After closing the control box, the programming is complete for Operating Mode 2 and the unit is ready for operation.

OPERATING OPTIONS:

The **SETUP** mode provides a visual indication that the motion detector is operating and the unit is correctly aligned with the area you want to video. To use the **SETUP** mode, select Y when the **SETUP?** prompt appears on the display, then press Y again as instructed by the display. Once **SETUP** mode has been selected, walking in front of the unit will cause the red LED on the front of the unit to flash whenever the motion detector senses motion. This can be used to determine whether the motion detector is working at the range and area desired. To exit **SETUP** mode, press N as instructed by the display.

The default setting for the motion detector is about 50 feet (depending upon air temperature). While this setting will suffice for most applications, it is possible to change the setting by adjusting R14 of the CPU PCB. R14 is a blue potentiometer located on the left side of the CPU PCB. Rotating the screw clockwise will increase the detection range of the motion detector, while rotating it counter-clockwise will decrease the range.

REWIND mode allows the tape to be rewound by pressing Y at the **REWIND?** prompt. At the present time there is no beginning-of-tape sensor in the system, so the end of rewind must be determined by listening to the camcorder rewind motor. To exit **REWIND**, press N as instructed by the display.

PLAY mode is entered by pressing Y at the **PLAY?** prompt. A tape counter has been provided and is displayed on the second line of the display. If the tape is fully rewound and then played back, the counter may be used to locate specific events on the tape. The counter display is in seconds, accurate to about one second per hour.

SEARCH mode is entered by pressing Y at the **SEARCH?** prompt. This mode allows particular events to be found on a tape without constant attention from an operator. If Y is pressed at the **SEARCH?** prompt, the display will change to **STOP AT INDEX #:**. Enter the tape counter number corresponding to the event you previously noticed in **PLAY** mode. The tape will play and then stop at the location on the tape corresponding to the number entered.

For example, say you completely rewound the tape and were playing it back and you saw a big buck walk by when the tape counter read 1000. Write down 1000. Then let's say you saw a bear at 1200. Write down 1200. Then, let's say you saw a gorilla at 1234. Write down 1234. Continue like this until all special events on the tape are written down. Rewind the tape fully. To have StumpCam™ find these special events automatically, scroll to the **SEARCH** mode and enter Y. At the **STOP AT INDEX #:**, enter the number of the first special event (in this case 1000). The tape will play and stop automatically at 1000 on the counter. Then you can play the tape to view the desired footage. Once the desired footage has played, press N to stop the tape. Scroll back to **SEARCH** and enter the

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number of the next event (in this case 1200). The tape will play from where you manually stopped it and stop automatically at 1200 on the counter. This sequence can be followed until all special events have been displayed.

CHARGING:

The internal 12-volt battery and the camcorder battery can be charged simultaneously with the charger supplied with your StumpCam™. Attach the pin and sleeve connector from the charger to the jack on the back of the StumpCam™ unit and plug the charger into a standard 110-volt wall socket. Make sure the power switch in the control box is in the **POWER** position. Complete recharge of the batteries can be accomplished in about 12 hours.

To automatically recharge the batteries in the field, a supplemental solar panel can be attached to the charger jack on the StumpCam™.

DATE AND TIME INDICATORS:

Current date and time can be stamped on the tape if you desire to know exactly when specific events occurred. This option is provided directly from the camcorder. Refer to your camcorder owner's manual for instructions on setting the correct date and time and how to have this information imprinted on the videotape. Your owner's manual will also provide information on how to turn this option off if you have no need to know exact timing of events and prefer an uncluttered view.

SOME TRICKS AND CAUTIONS

If you only want to record during the day, all you have to do is place a piece of tape over the light sensor on the front of the unit and turn off the *Nightshot* function of the camera. That will cause the unit, when the reset button is pressed to park the filter away from the camera, "fooling" it into thinking it is night time. [In future models, we plan on programming our units for various options, including day-only, night-only and day-night options. When that occurs, we can retrofit your unit with a new computer chip to update it.] Of word of caution, the infrared filter unit (patent pending) is a scientifically designed piece of equipment. Care should be taken to prevent the filter's surface from scratches, but it still can be scratched if you are not careful removing and replacing your camera into its mount. **AVOID BRUSHING THE FRONT OF THE CAMERA OR ITS LENS AGAINST THE FILTER'S SURFACE.**